

Sodium Arsenite as Control for Crabgrass, *Poa Annua*

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Sodium arsenite has been used as an herbicide since the early 20s, but to my knowledge it has never been looked upon very favorably in the South. Many outstanding herbicides have been developed since the release of chemical restrictions of World War II. These have been developed and used primarily for specific types of vegetative life. One of these chemicals may kill this plant but have little or no effect on another; but in using sodium arsenite I have found it to be adaptable to practically all of my herbicide problems.

The biggest problems in North Central Georgia are crabgrass, crowfoot, and dallisgrass. The pest of winter and spring is of course *poa annua*. I would not say that sodium arsenite will kill all undesirable plant life but when proportionately mixed with other herbicides there is no weed problem that cannot be handled. I shall endeavor to tell in this article of my experience, good and bad, with this particular herbicide.

Our initial experience with sodium arsenite was when we experimented with the hope of using it to step up our Bermuda and thereby avoid the unfavorable transition from rye to Bermuda. This normally caused a period of from six to eight weeks of the poorest putting conditions imaginable. Knowing that rye was easily killed by sodium arsenite we decided to kill the rye on one-half of each green as soon as conditions were favorable. These conditions appear approximately the last week or ten days of April. Test run in Spring of 1950 proved that 3 oz. sodium arsenite per 1,000 sq. ft. would give us the desired results. The first application was made the third week of April 1951 and all rye on the treated section was completely killed within 48 hours. Little attention was paid to atmospheric and soil temperatures, humidity and soil moisture. Those greens treated during the hottest portion of the day showed decisively adverse effects on the Bermuda. Still, a transfer from rye to Bermuda was successfully made the last week-end of May 1951.

Three-Way Treatment

After the transfer, another important fact loomed before us. The crabgrass on the treated side was lessened so much that it was rated 90 percent less than the untreated side. The untreated side was then treated with a similar treatment the second week of June 1951. The results were rated excellent. Little effect did the two treatments have on crowfoot or dallis, but we shall discuss these two later.

The following December I discovered that the side treated in April had little or no *poa annua* while the side treated in June was very heavily infested. I immediately began to plan for my weed control program of 1952 with this thought in mind; if the operation was properly done we could accomplish three jobs in one application of sodium arsenite. We could speed up the Bermuda by lessening the competition of rye and at the same time effectively control both crabgrass and *poa annua*. I read and studied what few records were kept of the 1951 operation and set up the plans for 1952. By burning the *poa* infested half first I would then have complete coverage in regards to this worrisome pest.

This operation was begun at 9:50 AM, April 28, 1952; after poling and allowing the grass to thoroughly dry. The temperature was 78°F, humidity low and the soil moisture on the side to be treated about one third the amount required for the optimum growth of rye grass. I mention these conditions here because they are of utmost importance and were disregarded in the first treatment with decisive disadvantages to the Bermuda. Wishing to avoid the same mistake, I carried and staked in the area to be treated a thermometer which was carefully read before mixing. For each 5 degree F increase in temperature I reduced the sodium arsenite one-quarter oz. The last two greens treated received a total of one-quarter ounce per thousand while the first three were treated with 3 oz. per 1000 sq. ft. I used 12.5 gal. of water at

60 lbs. spray pressure to treat an average of 4700 sq. ft. of putting surface and approaches. As I mentioned earlier, soil moisture must be at a minimum and the temperature high as possible for this particular job. Too much water would raise and lower these respectively and good results could not be obtained. No water was applied to the treated area for a period of 72 hours.

Photographs and examinations were made of each green April 30, to compare the treated and untreated areas. Results were rated excellent in the killing of rye and poa with the exception of one green that was shaded for about two hours after treatment. This green was then treated with $\frac{1}{2}$ oz. sodium arsenite per 1000 sq. ft. and a good kill was effected. Little if any adverse effects were noticed on the Bermuda. The Bermuda was then sprayed with calcium ammonium nitrate at the rate of $\frac{1}{2}$ lb. nitrogen per 1000 sq. ft. and every 10 days thereafter. Just seven days after treatment the Bermuda was making a fast headway. Prior to each application of plant food the greens were brushed and mowed at $\frac{7}{16}$ in. to remove the dead matter and allow the sunlight to reach the Bermuda. After a moderate top-dressing an effective transfer from rye to Bermuda was made with no interference with golfing conditions. No more difference was noticed other than the usual difference of Bermuda putting qualities. You must remember that the untreated side of each green was being kept in tip-top playing condition while this work was being done.

Crabgrass Control

After the transfer, the remaining untreated half was sprayed with sodium arsenite for the control of now germinating crabgrass. This job was done like the first but the lowest rate of sodium arsenite was $\frac{1}{2}$ oz. rather than the $\frac{1}{4}$ oz. rate of the first application. Sodium arsenite seems to affect the crabgrass seeds in such a manner as to lessen the possibility of germination. After it does germinate however, the young seedling requires more chemical and hotter weather to kill it. On June 16, four men hand picked all 18 greens of any remaining weeds. This job required only four hours or 16 man hours; less than an hour per green. Since our greens average approximately 9,000 sq. ft. you can see the results that sodium arsenite has given us. I do not say that this same application

can give you these results but with a little experimentation you can find the application that will do the desired job.

This past summer we experimented with the hopes of carrying this treatment to our fairways. At temperatures that ranged from 85° to 103° and using rates of one to 15 gal. sodium arsenite per 50 gal. of water per acre we found that 10 gal. of chemical per acre when the temperature was 85° and higher was the answer. At this rate and temperature a burn of Bermuda will occur but will pass in 7-10 days. Later we noticed in the treated areas that the Dallisgrass failed to produce mature seed and on areas treated with heavier concentrations no seed heads whatsoever. We shall delve into this more closely this summer.

The crowfoot and Dallis, though sickly after treatment, were not killed by either the early or late application. Those plants germinating after hand weeding were individually treated. Though some superintendents may object to this method due to spots from burning, they will find these spots disappearing in four to five days. I had found that sodium arsenite alone would not kill either of these weeds but that a mixture of sodium arsenite and other chemicals would. The crowfoot is easily killed in one application by applying three parts sodium arsenite and two parts potassium cyanate per 2 gal. water and spraying directly on the crown of each plant. The plants must not be watered for at least 48 hours and the temperature at least 85°F. The Dallisgrass is a more worthy opponent and three years of experimentation has failed to provide us with a perfect eradicator to cope with this pest of both fairways and greens. Some of our test plots have received an equivalent application of 120 gal. of pure chemical. The Dallis has survived but other plant life has been destroyed for the full three year period. I have obtained fair results with a mixture of other chemicals but these results were obtained only after repeated application and require too many man hours to be very practical.

I believe that sodium arsenite is the answer for those of us with rye and Bermuda greens. When applied properly sodium arsenite kills rye and poa annua and therefore hastens the development of the Bermuda grasses. It is the simplest, quickest, surest and most economical method I know of for the eradication of

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Sodium Arsenite

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that plague known as crabgrass. A close examination of our greens this past winter shows little or no poa while our fairways are thoroughly infested. This one fact alone would make me want to use sodium arsenite since our heaviest play is in the Spring months and we know that poa definitely does not have the putting qualities of a fine rye green.

None of this type of work can be done without the support and wholehearted approval of your green chairman and his members. I inform the chairman about three weeks prior to spraying and he in turn with the professional tell the members of my intentions. There were some squawks at first but when they moved from rye to Bermuda without interference to play, the members backed us to the hilt. April, May, and June constitute a good forty percent of our yearly play so you can easily see what an important decision was made. **THE END JUSTIFIES THE MEANS.**

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